

## **DETAILED ACTION**

### ***Response to Amendment***

1. The Applicants' amendment, filed 8 May 2008, has been received, entered into the record, and considered.
2. As a result of the amendment, claims 1, 3, 6-9, 12, 16-18, 21-25, 28-30, 32-34, 36 and 42 have been amended, claims 2, 10, 31 and 43 have been canceled, and new claims 44-49 have been added. Claims 4, 5, 11, 13-15, 19, 20, 27, 31, 35, 37 and 38 have been previously canceled. Claims 1, 3, 6-9, 12, 16-18, 21-26, 28-30, 32-34, 36, 39-42 and 44-49 are now pending in the application.

### ***Claim Rejections - 35 USC § 112***

3. In view of the Applicants' cancellation of claim 43, the pending claim rejection under 35 U.S.C. § 112 is withdrawn.

### ***35 USC § 101***

4. Regarding claim 42 (and its dependent claims), this claim cites a computer readable storage medium. In the absence of any modifying disclosure of this limitation in the specification, the examiner interprets the term 'computer readable storage

medium' as excluding printed paper, transmission media, signals, or any form of energy, such that the claim clearly falls within a statutory class of invention as required under the terms of 35 U.S.C. § 101.

### **EXAMINER'S AMENDMENT**

5. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with attorneys Christopher P. Wrist and Jon Strang on 30 July 2008.

The application has been amended as follows:

1. (currently amended) A computer-implemented method for providing a recommendation list from a plurality of items, comprising:

receiving an adaptable constraint to apply during searches performed in response to recommendation requests, wherein the adaptable constraint includes a plurality of free variables;

receiving a recommendation request including a plurality of values defined by a user, wherein the plurality of values includes at least one value for each of the plurality of free variables in the adaptable constraint;

binding the received values to the corresponding free variables to update the adaptable constraint;

searching the plurality of items in response to the received recommendation request, wherein a set of search parameters is defined by the updated adaptable constraint, and wherein the searching includes:

determining an order for applying a recommendation filter and a constraint filter using a cost calculation based at least on (i) a number of results required, (ii) a probability that a randomly selected item of the plurality of items will pass the second applied filter of the recommendation filter and the constraint filter, (iii) a cost of applying the first applied filter of the recommendation filter and the constraint filter to generate a single item, and (iv) a cost of applying the second applied filter to the single item;

selecting an item from the plurality of items and, in the determined order,

applying the constraint filter, comprising determining if the item satisfies the updated adaptable constraint for the recommendation request, and

applying the recommendation filter, comprising computing a predicted value based on the recommendation filter and determining if the predicted value exceeds a predetermined number,

wherein if the item does not pass the first applied filter, the item is discarded; and

appending the item to the recommendation list if the item passes both filters; and

transmitting the recommendation list for presentation on a device.

16. (currently amended) An apparatus for providing a recommendation list from a plurality of items in a data processing system, comprising:

a processing component configured to process instructions for selecting items from the plurality of items, wherein the processing component includes:

a constraint filter including at least one constraint having a plurality of free variables, wherein a value for each free variable is defined by a ~~the~~ user;

a recommendation filter; and

an order determination module configured to determine an order for applying the constraint filter and the recommendation filter using a cost calculation based at least on (i) a number of results required, (ii) a probability that a randomly selected item will pass the second applied filter of the constraint filter and the recommendation filter, (iii) a cost of applying the first applied filter of the recommendation filter and the constraint filter to generate a single item, and (iv) a cost of applying the second applied filter to the single item;

an input component configured to receive a recommendation request including a value defined by the user for each of the free variables in the constraint;

a recommender component configured to perform a search in response to a received recommendation request, wherein a set of search parameters is defined by the constraint, and to generate a recommendation list based on the constraint filter and the recommendation filter; and

an output component configured to transmit the generated list for presentation on a device.

29. (currently amended) A computer-implemented method of generating recommendation lists from a plurality of items having assigned category memberships representing attributes of the items, comprising:

receiving a plurality of recommendation requests;

applying, during a search of the plurality of items performed for each recommendation request, a series of filters to each of the items, the series comprising a constraint filter and a recommendation filter for furnishing a predicted rating value, wherein the recommendation filter and the constraint filter are applied in an order determined using a cost calculation based at least on (i) a number of results required, (ii) the probability that a randomly selected item will pass the second applied filter of the recommendation filter and the constraint filter, (iii) a cost of applying the first applied filter of the recommendation filter and the constraint filter to generate a single item, and (iv) a cost of applying a second applied filter to the single item,

wherein the constraint filter is selected based on attributes associated with the recommendation request, wherein the constraint filter applies a constraint to the parameters of the search, the constraint having a plurality of free variables each free variable in the plurality of free variables has a value defined by the user;

generating, for each recommendation request, a recommendation list based on the predicted rating value for the item that passes the constraint filter and the recommendation filter; and

for each recommendation request, transmitting the generated list to a user for presentation on a device.

36. (currently amended) A method of generating a recommendation list from plurality of items having assigned category memberships representing attributes of the items, comprising:

building a constraint using constraint forming rules, wherein the constraint includes a plurality of free variables;

receiving a recommendation request including a plurality of values defined by a user, wherein the plurality of values includes at least one value for each of the plurality of free variables in the constraint;

binding the received values to the corresponding free variables to update the constraint;

incorporating the constraint into a constraint filter;

determining a cost for a first order based at least on (i) a number of results required, (ii) a probability that a randomly selected item will pass the recommendation filter, (iii) a cost of applying the constraint filter to generate a single item, and (iv) a cost of applying the recommendation filter to the single item, the first order being applying the constraint filter before applying the recommendation filter;

determining a cost for a second order based at least on (i) a number of results required, (ii) a probability that a randomly selected item will pass the constraint filter, (iii) a cost of applying the recommendation filter to generate a single item, and (iv) a cost of applying the constraint filter to the single item, the second order being applying the recommendation filter before applying the constraint filter;

establishing one of the first and second orders as the lowest cost order based on the respective costs thereof;

applying a series of filters to each of the plurality of items during a search performed in response to the recommendation request, the series comprising the recommendation filter and the updated constraint filter in the lowest cost order, wherein a set of parameters for the search is defined by the constraint;

generating a list of recommendations based on the predicted rating values for the items that pass the constraint filter and the recommendation filter; and

transmitting the generated list to the user for presentation on a device.



42. (currently amended) A computer program product comprising a ~~tangible~~ computer ~~usable~~ readable storage medium including control logic stored therein, the control logic enabling the generation of a recommendation list, by a method comprising:

receiving an adaptable constraint to apply during searches performed in response to recommendation requests, wherein the adaptable constraint includes a plurality of free variables;

receiving a recommendation request including a plurality of values defined by a user, wherein the plurality of values includes at least one value for each of the plurality of free variables in the adaptable constraint;

binding the received values to the corresponding free variables to update the adaptable constraint; and

searching a plurality of items in response to the received recommendation request, wherein a set of search parameters is defined by the updated adaptable constraint, comprising:

determining an order of applying a recommendation filter and a constraint filter using a cost calculation based at least on (i) a number of results

required, (ii) a probability that a randomly selected item will pass a second applied filter of the recommendation filter and the constraint filter, (iii) a cost of applying the first applied filter of the recommendation filter and the constraint filter to generate a single item, and (iv) a cost of applying the second applied filter to the single item;

selecting an item from the plurality of items,

applying a first filter of the recommendation filter and the constraint filter according to the determined order,

if the item does not pass the first applied filter, discarding the item,

if the item passes the first applied filter, applying the second filter of the recommendation filter and the constraint filter according to the determined order, and

if the item passes both the first and second filters, appending the item to the recommendation list.

49. (currently amended) A method for providing a recommendation list, comprising:

receiving a recommendation request including a value corresponding to a free variable of a constraint; and

generating a recommendation list of at least one item of a plurality of items in response to the recommendation request, comprising:

determining an order for applying a constraint filter, including the constraint, and a recommendation filter, based at least on (i) a number of results required, (ii) a probability that a randomly selected item of the plurality of items will pass a second applied filter of the recommendation filter and the constraint filter, (iii) a cost of applying the first applied filter of the recommendation filter and the constraint filter to generate a single item, and (iv) a cost of applying the second applied filter to the single item;

selecting an item from the plurality of items;

applying a first filter of the recommendation filter and the constraint filter according to the determined order;

applying a second filter of the recommendation filter and the constraint filter according to the determined order if the item passes the first filter; and

appending the item to the recommendation list if the item passes both the first filter and the second filter.

50. (new) The computer implemented method according to claim 1, wherein the cost calculation is based at least on a predetermined relationship among (i) a number of results required, (ii) a probability that a randomly selected item of the plurality of items will pass the second applied filter of the recommendation filter and the constraint filter, (iii) a cost of applying the first applied filter of the recommendation filter and the constraint filter to generate a single item, and (iv) a cost of applying the second applied filter to the single item.

51. (new) The apparatus of claim 16, wherein the cost calculation is based at least on a predetermined relationship among (i) a number of results required, (ii) a probability that a randomly selected item of the plurality of items will pass the second applied filter of the recommendation filter and the constraint filter, (iii) a cost of applying the first applied filter of the recommendation filter and the constraint filter to generate a single item, and (iv) a cost of applying the second applied filter to the single item.

52. (new) The computer implemented method according to claim 29, wherein the cost calculation is based at least on a predetermined relationship among (i) a number of results required, (ii) a probability that a randomly selected item of the plurality of items will pass the second applied filter of the recommendation filter and the constraint filter, (iii) a cost of applying the first applied filter of the recommendation filter and the constraint filter to generate a single item, and (iv) a cost of applying the second applied filter to the single item.

53. (new) The method according to claim 36, wherein the cost for the first order is based at least on a predetermined relationship among (i) a number of results required, (ii) a probability that a randomly selected item of the plurality of items will pass the recommendation filter, (iii) a cost of applying the constraint filter to generate a single item, and (iv) a cost of applying the recommendation filter to the single item, and

wherein the cost for the second order is based at least on a predetermined relationship among (i) a number of results required, (ii) a probability that a randomly selected item of the plurality of items will pass the constraint filter, (iii) a cost of applying the recommendation filter to generate a single item, and (iv) a cost of applying the constraint filter to the single item.

54. (new) The computer program product of claim 42, wherein the cost calculation is based at least on a predetermined relationship among (i) a number of results required, (ii) a probability that a randomly selected item of the plurality of items will pass the second applied filter of the recommendation filter and the constraint filter, (iii) a cost of applying the first applied filter of the recommendation filter and the constraint filter to generate a single item, and (iv) a cost of applying the second applied filter to the single item.

55. (new) The method according to claim 49, wherein the cost calculation is based at least on a predetermined relationship among (i) a number of results required, (ii) a probability that a randomly selected item of the plurality of items will pass the second applied filter of the recommendation filter and the constraint filter, (iii) a cost of applying the first applied filter of the recommendation filter and the constraint filter to generate a single item, and (iv) a cost of applying the second applied filter to the single item.

*Allowable Subject Matter*

6. Claims 1, 3, 6-9, 12, 16-18, 21-26, 28-30, 32-34, 36, 39-42 and 44-55 are allowed.

7. The following is an examiner's statement of reasons for allowance:

The present invention is directed to a method and apparatus for providing recommendations to a user, whereby in addition to information indicative of the user's interests, additional filtering criteria is applied in order to prevent the recommendation of items that, while strictly meeting the interest criteria of the user, are not appropriate for recommendation. Examples of reasons for such items being inappropriate are, for instance, items that are out of stock or otherwise currently unavailable; items which are out of season; or items which the age or other characteristics of the user renders inappropriate.

This is done through the use of constraint filters which are associated with a first set of attributes, and wherein said constraint filters are applied to those recommendation requests having the associated first set of attributes.

The closest prior art of record, **Aggarwal et al.** (U.S. Patent 6,487,539) discloses a system for providing product recommendations to customers in an e-commerce environment by generating content and compatibility representations of products corresponding to a plurality of customers.

**Valentin et al.** (Canadian Patent 2,249,096) discloses the practice of query optimization, a process wherein a database query is decomposed into its smallest component database transactions, and the order in which those transactions are executed is arranged in order to minimize the amount of time required to complete the query, thus minimizing the 'cost' of the query.

**Cariño, Jr.** (U.S. Patent 6,067,542) discloses that when ordering a number of filters to optimize performance, the ordering should be performed based in part on the selectivity of each of the filters.

However, the prior art of record fails to anticipate or render obvious the recited feature of determining an order of applying a recommendation filter and a constraint filter using a cost calculation based at least on (i) a number of results required, (ii) a probability that a randomly selected item will pass a second applied filter of the recommendation filter and the constraint filter, (iii) a cost of applying the first applied



filter of the recommendation filter and the constraint filter to generate a single item, and  
(iv) a cost of applying the second applied filter to the single item, as in independent claims 1, 16, 29, 36, 42 and 49.

These features, together with the other limitations of the independent claims are novel and non-obvious over the prior art of record. The dependent claims 3, 6-9, 12, 17, 18, 21-26, 28, 30, 32-34, 39-41, 44-48 and 50-55 being definite, enabled by the specification, and further limiting to the independent claim, are also allowable.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

*Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luke S. Wassum whose telephone number is 571-272-4119. The examiner can normally be reached on Monday-Friday 8:30-5:30, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Cottingham can be reached on 571-272-7079. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

In addition, INFORMAL or DRAFT communications may be faxed directly to the examiner at 571-273-4119, or sent via email at [luke.wassum@uspto.gov](mailto:luke.wassum@uspto.gov), **with a previous written authorization in accordance with the provisions of MPEP § 502.03.** Such communications must be clearly marked as INFORMAL, DRAFT or UNOFFICIAL.

Customer Service for Tech Center 2100 can be reached during regular business hours at (571) 272-2100, or fax (571) 273-2100.

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31 July 2008